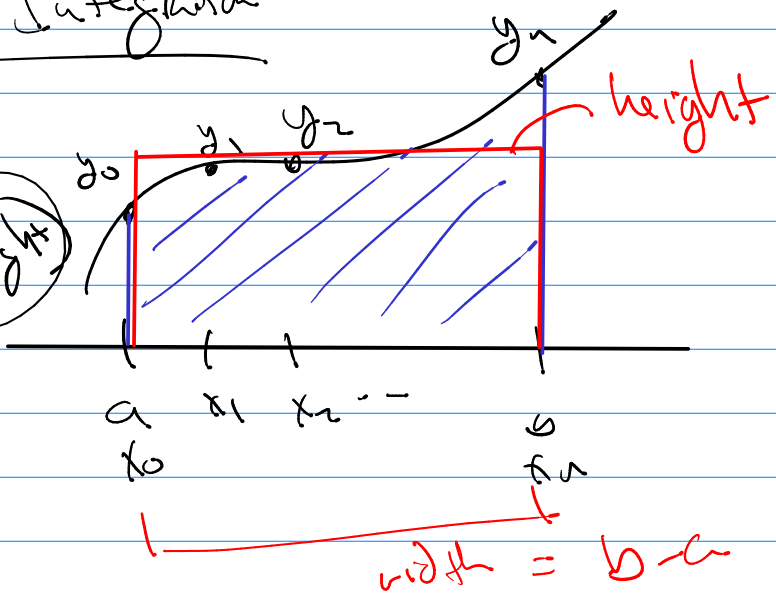
Math 451

Q's! Numeric Integration

L_n –
R_n –
M_n –
T_n –
S_n –

$= (b-a)$(height)



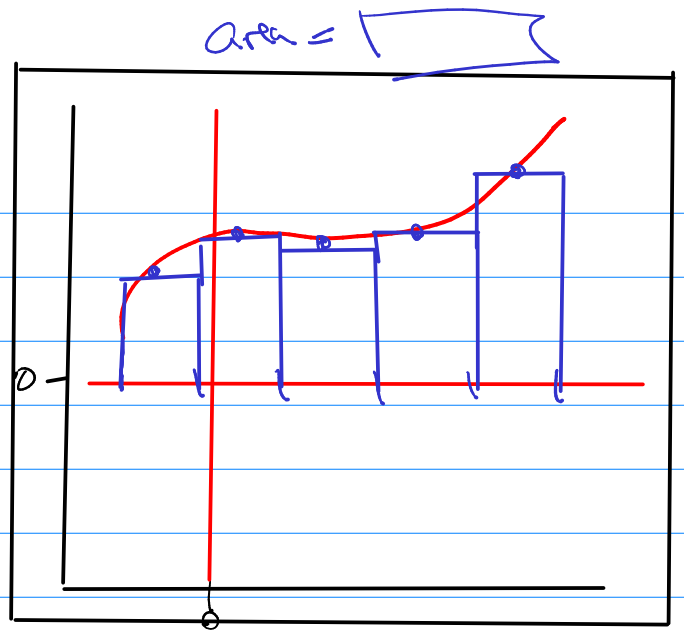
$$L_n = (b-a)(\text{average } y_0, y_1, \dots, y_{n-1})$$

$$T_n = (b-a)\left(\frac{y_0 + 2y_1 + 2y_2 + \dots + 2y_{n-1} + y_n}{2n}\right)$$

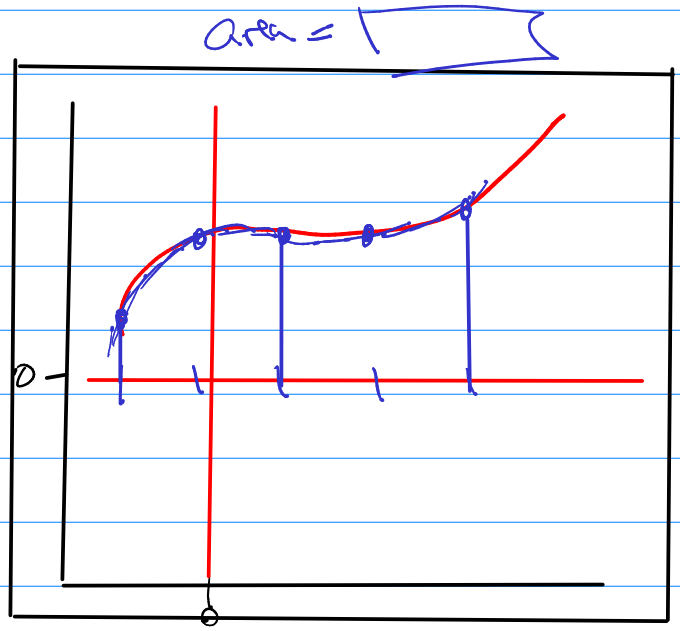
$$S_n = (b-a)\left(\frac{y_0 + 4y_1 + 2y_2 + 4y_3 + \dots + 4y_{n-1} + y_n}{3n}\right)$$

Graphical — Integrate f from a to b using n intervals by (switch on tech)

(+) figure → (n switch was Mid point method)



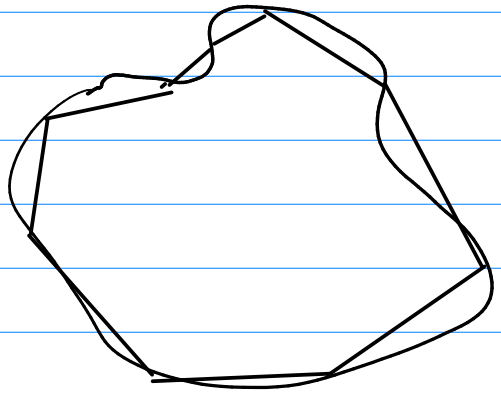
Mid point figure

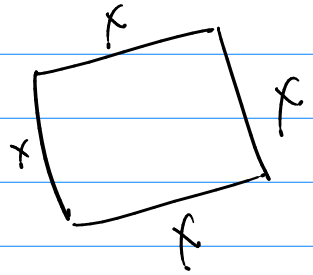


Simpson's figure

Chaos game

IFS fractal



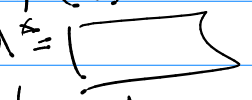


1D $(l)^1$

2D $(l)^2$ 

3D $(l)^3$ 

$l \to 0 \quad M \to \infty$

$(l)^d$ < $d \to \infty$  $(l)^d = \infty$

$(l)^d = 0$